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Conference Abstract

Species Distribution Modelling Using Deep Learning

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Abstract

Species distribution modelling, or ecological niche modelling, is a collection of techniques for the construction of correlative models based on the combination of species occurrences and GIS data. Using such models, a variety of research questions in biodiversity science can be investigated, among which are the assessment of habitat suitability around the globe (e.g. in the case of invasive species), the response of species to alternative climatic regimes (e.g. by forecasting climate change scenarios, or by hindcasting into palaeoclimates), and the overlap of species in niche space. The algorithms used for the construction of such models include maximum entropy, neural networks, and random forests. Recent advances both in computing power and in algorithm development raise the possibility that deep learning techniques will provide valuable additions to these existing approaches. Here, we present our recent findings in the development of workflows to apply deep learning to species distribution modelling, and discuss the prospects for the large-scale application of deep learning in web service infrastructures to analyze the growing corpus of species occurrence data in biodiversity information facilities.

Keywords

species distribution modelling, ecological niche modelling, deep learning, machine learning, biodiversity informatics, GIS, species occurrences

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Ethics and security

N/A

Conflicts of interest

None indicated